



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of:	)	
O'CONNOR, Stephen D. et al.	)	Group Art Unit: 1723
	)	
Title: <b>MULTI-STREAM MICROFLUIDIC MIXERS</b>	)	Examiner: SOOHOO, Tony Glen
	)	
Serial Number: 10/046,071	)	Attorney Docket: 270/219
	)	
Filed: January 11, 2002	)	

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**


Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with 37 CFR §§ 1.97 and 1.98, the items identified in this Information Disclosure Statement ("IDS") are brought to the attention of the Office. The items are listed on the attached form PTO-1449 and copies are enclosed for the convenience of the Examiner.

The items identified in this IDS may or may not be "material" pursuant to 37 CFR § 1.56. The submission thereof by Applicants is not to be construed that any such patent, publication, or other information referred to therein is material or considered to be material (37 CFR § 1.97(h)), or even qualifies as "prior art" under 35 USC § 102 with respect to this invention unless specifically designated by Applicants as such.

Respectfully submitted,

  
Vincent K. Gustafson  
Reg. No. 46,182

Dated: March 2, 2004

**USPTO Customer No.: 32763**

270/219

10/046,071

**OFFICE OF PATENTS AND OTHER ITEMS FOR APPLICANT'S  
INFORMATION DISCLOSURE STATEMENT**
**APPLICANT:**

O'CONNOR, Stephen D. et al.

**FILING DATE:**

January 11, 2002

**GROUP:**

1723

(Use several sheets if necessary)

## U.S. PATENT DOCUMENTS

EXAMINER INITIALS		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE
	A1	6,537,506 B1	3/25/2003	Schwalbe et al.	422	130	2/3/2000
	A2	2002/0192701 A1	12/19/2002	Adey	435	6	8/2/2002
	A3	6,494,614 B1	12/17/2002	Bennett et al.	366	336	9/21/1999
	A4	6,482,306 B1	11/19/2002	Yager et al.	204	600	9/22/1999
	A5	6,409,832 B2	6/25/2002	Weigl et al.	117	206	3/30/2001
	A6	2002/0076350 A1	6/20/2002	Weigl et al.	422	58	9/18/2001
	A7	2002/0048535 A1	4/25/2002	Weigl et al.	422	100	9/18/2001
	A8	2001/0048900 A1	12/6/2001	Bardell et al.	422	100	5/23/2001
	A9	2001/0048637 A1	12/6/2001	Weigl et al.	366	341	5/24/2001
	A10	6,287,520 B1	9/11/2001	Parce et al.	422	100	1/21/2000
	A11	6,235,471 B1	5/22/2001	Knapp et al.	435	6	4/3/1998
	A12	6,193,471 B1	2/27/2001	Paul	417	53	6/30/1999
	A13	6,186,660 B1	2/13/2001	Kopf-Sill et al.	366	340	7/26/1999
	A14	5,945,203	8/31/1999	Soane	428	209	10/14/1997
	A15	5,932,799	8/3/1999	Moles	73	53.01	7/21/1997
	A16	5,932,315	8/3/1999	Lum et al.	428	172	4/30/1997
	A17	5,904,824	5/18/1999	Oh	204	601	3/7/1997
	A18	5,882,571	3/16/1999	Kaltenbach et al.	264	400	3/27/1997
	A19	5,882,465	3/16/1999	McReynolds	156	285	6/18/1997
	A20	5,872,010	2/16/1999	Karger et al.	436	173	7/3/1996
	A21	5,849,208	12/15/1998	Hayes et al.	216	94	9/7/1995
	A22	5,658,515	8/19/1997	Lee et al.	264	219	9/25/1995
	A23	5,640,995	6/24/1997	Packard et al.	137	597	3/14/1995
	A24	5,545,367	8/13/1996	Bae et al.	264	401	5/27/1993

**EXAMINER:****DATE CONSIDERED:**

EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant

270/219

10/046,071

## APPLICANT:

O'CONNOR, Stephen D. et al.

## FILING DATE:

January 11, 2002

## GROUP:

1723

LIST OF PATENTS AND OTHER ITEMS FOR APPLICANT'S  
INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

## U.S. PATENT DOCUMENTS

EXAMINER INITIALS		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE
	A25	5,443,890	8/22/1995	Öhman	428	167	2/4/1992
	A26	5,385,709	1/31/1995	Wise et al.	422	98	6/24/1993
	A27	5,376,252	12/27/1994	Ekström et al.	204	299 R	11/10/1992
	A28	5,230,866	7/27/1993	Shartle et al.	422	103	3/1/1991
	A29	5,222,808	6/29/1993	Sugarman et al.	366	274	4/10/1992
	A30	5,194,133	3/16/1993	Clark et al.	204	299 R	5/3/1991

## FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS		DOCUMENT NUMBER	DATE	COUNTRY	NAME	TRANSLATION? YES NO
	B1	WO 02/10732 A1	2/7/2002	WIPO	Ausserer et al.	
	B2	WO 00/22436	4/20/2000	WIPO	McNeely et al.	
	B3	WO 00/21659	4/20/2000	WIPO	Burdon et al.	
	B4	EP 0 933 126 A1	8/4/1999	EPC	Winkler et al.	
	B5	WO 99/17093	4/8/1999	WIPO	Handique et al.	
	B6	EP 0 107 631 A2	5/2/1984	EPC	Ruzicka et al.	

EXAMINER  
INITIALS

## NON PATENT LITERATURE DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

	C1	Stroock, Abraham D. et al., "Chaotic Mixer for Microchannels," Science Magazine, Vol. 295, pp. 647-651, January 25, 2002
	C2	Liu, Robin H. et al., "Plastic In-Line Chaotic Micromixer for Biological Applications," <u>Micro Total Analysis Systems</u> , J.M. Ramsey and A. van den Berg (eds.), 2001 Kluwer Academic Publishers, The Netherlands, pp. 163-164
	C3	Jacoby, Mitch, <i>Chemistry Flows Like Clockwork – Flow system used to make simple devices for time-dependent studies</i> , "Chemical & Engineering News," February 24, 2003, p.5
	C4	Deshmukh, Ajay A. et al., A.P. (2000), "Continuous Micromixer with Pulsatile Micropumps," Solid-State Sensor and Actuator Workshop, Hilton Head Island, SC, USA, 4-8 June 2000, pp. 73-76
	C5	Martin, P.M. et al., <i>Laser micromachined and laminated microchannel components for chemical sensors and heat transfer applications</i> , "Micromachined Devices and Components III," SPIE – The International Society for Optical Engineering, Vol. 3224, Bellingham, Washington, USA, pp. 258-265
	C6	Tracey, M.C. et al., "Microfluidic Mixer Employing Temporally-Interleaved Liquid Slugs and Parabolic Flow," <u>Micro Total Analysis Systems</u> , J.M. Ramsey and A. van den Berg (eds.), 2001 Kluwer Academic Publishers, The Netherlands, pp. 141-142

EXAMINER:

DATE CONSIDERED:

EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant

**LIST OF PATENTS AND OTHER ITEMS FOR APPLICANT'S  
INFORMATION DISCLOSURE STATEMENT**

(Use several sheets if necessary)

EXAMINER INITIALS	NON PATENT LITERATURE DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)
C7	Ehrfeld, W. et al., <i>Potentials and Realization of Microreactors</i> , "DECHEMA Monographs," Vol. 132, VCH Verlagsgesellschaft, 1996, pp. 1-28
C8	Johnson, Timothy J. et al., <i>Rapid Microfluidic Mixing</i> , "Analytical Chemistry," Vol. 74, No. 1, January 1, 2002, pp. 45-51
C9	Verpoorte, Elisabeth M.J. et al., "Silicon-Based Chemical Microsensors and Microsystems," <i>Interfacial Design and Chemical Sensing</i> , American Chemical Society, 1994, Chapter 21, pp. 244-254
C10	Yang, Xing et al., "A MEMS Thermopneumatic Silicone Membrane Valve," (1998) <i>Sensors and Actuators A: Physical</i> , Vol. 64, pp. 101-108
C11	Schulte, Thomas, "The Development of Practical Microfluidic-Based Systems for Chemical and Blood Analysis," (1999) in <i>Drug Discovery Technology for the New Millennium Chapter 13</i> , pp. 127-135. Conference proceeding: IBC USA Conferences, Inc.: 4 <sup>th</sup> Annual Conference on Microfabrication and Microfluidic Technologies
C12	Becker, Holger et al., "Silicon as Tool Material for Polymer Hot Embossing," (1999) <i>Proceedings MEMS '99 Orlando</i> , 228-231
C13	Jeon, Noo Li et al., "Large-Area Patterning by Vacuum-Assisted Micromolding," (1999) <i>Adv. Mater.</i> 11, No. 11:946-950
C14	Jackman, Rebecca J., et al., "Electrochemistry and soft lithograph: A route to 3-D microstructures", (May 1999) <i>Chemtech</i> 18-30.
C15	Folch, A., et al., "Molding of Deep Polydimethylsiloxane Microstructures for Microfluidics and Biological Applications" (Feb 1999) <i>Journal of Biomechanical Engineering</i> 121:28-34.
C16	Duffy, David C., et al., "Rapid Prototyping of Microfluidic Systems in Poly(dimethylsiloxane)", (Dec 1998) <i>Analytical Chemistry</i> 70:4974:4984.
C17	Grzybowski, B. A., et al., "Generation of Micrometer-Sized Patterns for Micranalytical Applications Using a Laser Direct-Write Method and Microcontact Printing", (Nov 1998) <i>Analytical Chemistry</i> 70:4645-4652.
C18	Gonzalez, C., et al., "Fluidic interconnects for modular assembly of Chemical Microsystems", (Jan 1998) <i>Sensors and Actuators B</i> 49:40-45.
C19	Qin, Dong, et al., "Microfabrication, Microstructures and Microsystems", (1998) <i>Topics in Current Chemistry</i> 194:1-19.
C20	Fuhr, G., et al., "Biological Application of Microstructures", (1998) <i>Topics in Current Chemistry</i> 194:83-116.
C21	Cordova, Emilio, et al., "Noncovalent Polycationic Coatings for Capillaries in Capillary Electrophoresis of Proteins" (April 1997) <i>Analytical Chemistry</i> 69:1370-1379.
C22	McCormick, Randy M., et al., "Microchannel Electrophoretic Separations of DNA in Injection-Molded Plastic Substrates" (Dec 1997) <i>Analytical Chemistry</i> 69:2626-2630.
C23	Martynova, Larisa et al., "Fabrication of Plastic Microfluid Channels by Imprinting Methods" (1997) <i>Anal. Chem.</i> 69:4783-4789.
C24	Kovacs, Gregory T.A., et al., "Silicon Micromachining Sensors to Systems" (July 1996) <i>Analytical Chemistry News &amp; Features</i> 407A-412A.
C25	Shoji, Shuchi, et al., "Microflow Devices and Systems" (Oct 1994) <i>J. Micromech. Microeng.</i> 4:157-171.
C26	Schomburg, W.K., et al., "Microfluidic Components in LIGA Technique" (Feb 1994) <i>J. Micromech. Microeng.</i> 4:186-191.
C27	Verpoorte, Elisabeth M.J., et al., "Three-Dimensional Micro Flow Manifolds for Miniaturized Chemical Analysis Systems" (Oct 1994) <i>J. Micromech. Microeng.</i> 4:246-256.

EXAMINER:

DATE CONSIDERED:

EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant